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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,474	11/14/2001	Seung-Beom Park	8071-5 (OPP 000681 US)	7543
22150	7590	12/14/2004	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797				KIELIN, ERIK J
			ART UNIT	PAPER NUMBER
				2813

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/992,474	PARK ET AL.	
	Examiner	Art Unit	
	Erik Kielin	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 August 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-9 and 14-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 August 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>12/3/2004</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 25 August 2004 have been entered.

Drawings

2. The drawings were received on 25 August 2004. These drawings are acceptable.

Rule 37 CFR 1.105 Requirement for Information

3. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

The priority document (KR 1998-42709) of US 6,577,366 B1 (Kim et al.) has disclosed therein Fig. 9, which is virtually identical to Fig. 1b of the instant application. KR 1998-42709 is assigned to the same assignee as, and has common inventors to, the instant application. Depending upon the date of publication of the KR 1998-42709, it would surely constitute an anticipatory reference to the subject matter presently claimed in at least instant claims 15-20. Accordingly, the above document and especially its publication date of and any related references are requested in response to this Office action.

Claim Objections

4. Claim 14 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Independent claim 9 indicates that the domain defining member has a longitudinal opening in the pixel electrode and claim 14 requires plural openings. As presently written, this broadens rather than narrows claim 9.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 2, and 3 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The features of the LCD which enable “a quotient greater than or equal to about 0.8 for all viewing angles” critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Applicant’s own arguments suggest that the limitation,

“wherein a voltage value of a first gray (called “ V_{OFF} ”) representing the darkest state applied between the pixel electrode and the common electrode is within a voltage range for yielding a quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero”

does not apply to all LCDs. Applicant has repeatedly argued that the ratio in **Hirose** does not apply to all viewing angles, in spite Applicant's recognition that for at least one viewing angle in **Hirose**, this ratio is **infinity**. (SEE sections entitled, "REMARKS" filed 22 January 2004 at p. 11, and filed 25 August 2004, pages 8-10.) All else recited in independent claim 1 are notoriously common features of an LCD (i.e. first and second panels, pixel and common electrodes, and a liquid crystal layer). Since Applicant argues that the **Hirose** disclosure of a "quotient greater than or equal to about 0.8" --it is in fact infinite in **Hirose**-- for at least at **one** viewing angle does not apply to **all** viewing angles --**Hirose** having disclosed **all** other features of claim 1-- it necessarily follows that Applicant effectively argues that claim 1 fails to recite the critical structural features of the LCD that enables that "quotient...for **all** viewing angles. Simply claiming an **inherent feature** of the LCD of claim 1 is not enabling of how to achieve it because the critical elements required to achieve this are not recited in the claim, as is apparent from Applicant's own arguments, and as required by precedent of *In re Mayhew*. The claims must provide the structural limitations which enable this inherent feature of the "quotient greater than or equal to about 0.8 for **all** viewing angles." Applicant admits that **Hirose** teaches this "quotient" for one viewing angle, but that it would not apply to other viewing angles even though **Hirose** teaches all of the other claimed features. Then what critical feature of Applicant's LCD enables this for **all** viewing angles? Note again, features critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Examiner respectfully submits Applicant cannot claim an **inherent result**, i.e. the high contrast at all viewing angles, --that is highly desired in the art-- when Applicant has not enabled

but one means by which to achieve the result, as this amounts to claiming the invention of others who also have achieved this result; as demonstrated in Hirose below, perhaps by different means.

7. Claims 9, 14, and 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The amendment to claim 9 reads,

"the domain defining member including a longitudinal opening in the pixel electrode dividing a portion of the pixel electrode into two partitions and an aperture in the common electrode having at least one longitudinal portion **dividing one of the two partitions.**" (Emphasis added.)

The aperture is formed in the common electrode on the opposing second substrate and therefore cannot divide the partition of the pixel electrode. Accordingly the claim is not enabled. Claim 14 is rejected for depending from claim 9. (See instant Fig. 1a.)

Similarly, new claim 15 reads in pertinent part,

"the pixel electrode including an opening dividing an upper portion of the pixel electrode into two partitions and the common electrode including an opening having at least two portions, each of the at least two portions dividing a respective one of the two partitions."

The same problem exists as in claim 9: because the opening in the common electrode is not formed in the pixel electrode, the common electrode openings cannot divide the pixel electrode. The remaining claims 16-20 are rejected for depending from the above rejected claims. (See instant Fig. 1a.)

Claims 19 and 20 are further not enabled because each of these claims requires portions of the common electrode to form edges of the pixel electrode. This orientation of common electrode and pixel electrode cannot exist since the electrodes are formed on separate substrates separated by a liquid crystal layer and therefore cannot have edges in common. (See instant Fig. 1a.)

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, given the above noted amendment to claim 9, from which claim 14 depends, it is unclear where the plurality of openings is formed, the pixel electrode or the common electrode or both. Accordingly, the metes and bounds of the claim are indefinite.

Claim 16 recites the limitation "the upper portion" in line 2. There is insufficient antecedent basis for this limitation in the claim.

For the purposes of patentability, the claims will be interpreted as best understood.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,298,199 (**Hirose** et al.).

Regarding claim 1, **Hirose** discloses a liquid crystal display comprising:

a first panel **71** having inner and outer surfaces;

a second panel **73** facing the first panel and having inner and outer surfaces;

a pixel electrode provided on the inner surfaces of the first panel (col. 3, lines 62-67);

a common electrode provided on the inner surfaces of the second panel (col. 3, lines 62-67); and

a liquid crystal layer **72** (col. 3, lines 62-67) between the first and the second panels,

wherein a voltage value of a first gray (called “ V_{OFF} ”) representing the darkest state

applied between the pixel electrode and the common electrode is within a voltage range for yielding a quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero (col. 4, lines 30-49). Reasoning follows.

As stated by Applicant in the instant specification, “[t]he contrast ratio is defined as the luminance of the sixty-fourth gray divided by that of the first gray,” wherein the “first gray represents the darkest state.” With this definition in mind, Fig. 2 of **Hirose** shows that the transmission (i.e. luminance) at zero applied volts exists, while **at some applied voltage, the transmission is virtually zero**. Then, the contrast at **zero** applied volts is **finite** while that the first gray (i.e. the applied voltage) is **infinite** (i.e. 64^{th} luminance divided by a number that is nearly equal to 0). Then the contrast ratio at the applied voltage divided by the contrast ratio at

zero voltage is infinity divided by some finite number which equals infinity which is infinitely greater than 0.8.

Hirose discloses that the contrast improvement is for all viewing angles because the asymmetry of viewing angles is eliminated (col. 2, lines 47-59; col. 4, lines 46-49).

It is seen to be inherent that the pixel and common electrodes are on the inner surfaces of the first and second substrates **71, 73**; otherwise, the electric field generated would be insufficient to control the orientation of the liquid crystals **72**.

Regarding claim 2, **Hirose** discloses the liquid crystal display of claim 1, further comprising a first and second polarizers **50, 80** disposed on respective outer surfaces of the first and the second panels (Fig. 1; col. 3, lines 57-60).

Regarding claim 3, **Hirose** discloses the liquid crystal display of claim 2, wherein the liquid crystal layer is vertically aligned in absence of electric field (Figs. 1 and 2; sentence bridging cols. 3-4).

12. Claims 15-20 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-352490 (**Kim et al.**) and notably assigned to the same assignee and having a common inventor as the instant application but not provided in an IDS.

Kim discloses a liquid crystal display comprising:

a first panel **20** having inner and outer surfaces (Fig. 4);

a second panel **10** facing the first panel and having inner and outer surfaces;

a pixel electrode **21** provided on the inner surface of the first panel **20**;

a common electrode **11** provided on the inner surface of the second panel **10**; and

a liquid crystal layer 110 between the first and the second panels, wherein the pixel electrode 21 and the common electrode 11 each include a plurality of openings 211, 212, 216, 217 (Fig. 3), 221, 222, 226, 227 (Fig. 5), 236, 237, 231, 232 (Fig. 6), 253, 254, 255, 256, 257 (Figs. 12 and 13) for restricting tilt directions of molecules 110 of the liquid crystal layer 110, the pixel electrode 21 including an opening dividing an upper portion of the pixel electrode into two partitions and the common electrode 11 including an opening having at least two portions, each of the at least two portions dividing a respective one of the two partitions, as shown in each of Figs. 3, 5, 6, 12 and 13.

Regarding claim 16, the liquid crystal display according to claim 15, wherein the opening dividing the upper portion (e.g. 216) and the at least two portions (the portions of pixel electrode 21 generated by opening 216) extend in the same direction (e.g. Figs. 3 and 4). As best understood given the present claim language, this is also shown in each of Figs. 5, 6, 12 and 13.

Regarding claim 17, the liquid crystal display according to claim 15, wherein the pixel electrode 21 includes a plurality of openings 216, 217 dividing a lower portion of the pixel electrode into a plurality of partitions (e.g. Figs. 3 and 4, also Figs. 5, 6, 12, and 13).

Regarding claim 18, the liquid crystal display according to claim 17, wherein the common electrode 11 includes at least two openings (e.g. 212) for respectively dividing at least two of the plurality of partitions (e.g. the partitions generated by openings 216 and/or 217).

Regarding claim 19, the liquid crystal display according to claim 17, wherein the common electrode 11 includes at least two openings (e.g. 211, 212) overlapping at least two of the plurality of partitions for respectively forming at least two edges of the lower portion of the pixel electrode 21 (e.g. Figs. 3 and 4)

Regarding claim 20, the liquid crystal display according to claim 15, wherein the opening in the common electrode (e.g. 211 and/or 212) having at least two portions includes a third portion perpendicular to the at least two portions forming an edge of the pixel electrode (e.g. Fig. 3).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirose** et al. in view of US 6,256,082 B1 (Suzuki et al., **Suzuki-2** hereafter).

Regarding claims 4, 5, and 7, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the electrodes further comprising domain-defining member for restricting the tilt directions of molecules in the liquid crystal layer, provided in one or both of the first and the second panels, wherein the domain-defining member is openings in the pixel electrode or the common electrode.

Suzuki-2 teaches that openings are provided in the pixel and/or common electrodes to restrict the tilt directions (col. 3, lines 17-23) which creates micro-regions (i.e. domains) and improves the contrast and view angle (col. 3, lines 13-16).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use domain-defining openings in the electrodes of **Hirose** to improve the contrast and view angle, as taught by **Suzuki-2**.

Regarding claim 6, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the voltage value of the first gray is equal to or lower than 1.4 V. The selection of 1.4 V or the first gray voltage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. See *In re Jones*, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and *In re Boesch*, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious). One of ordinary skill would be motivate to use a first gray voltage of less than 1.4 volts to minimize power consumption, thereby leading to a more energy-saving device.

Regarding claim 8, **Suzuki-2** teaches at least two micro-regions (i.e. domains), which reads on the limitation “wherein regions divided by the openings are classified into four domains depending on the tilt directions of the liquid crystal molecules.” (See Figs. 5a-5h).

15. Claims 9 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by JP 11-352490 (**Kim** et al.) in view of US 4,832,454 (**Walters**).

Regarding claim 9, **Kim** discloses a liquid crystal display comprising:
a first and second panel **10, 20** each having inner and outer surfaces, with inner surfaces facing each other (Fig. 4);

a common electrode 11 disposed on the inner surface of the first panel 10 and a pixel electrode 21 disposed on the inner surface of the second panel 20 (Fig. 4); and
a liquid crystal layer having crystal molecules 110 disposed between the first and second panels (Fig. 4),

wherein a domain defining member (e.g. 211, 212, 216, 217) is formed in the common electrode 11 (e.g. 211, 212) and the pixel electrode 21 (e.g. 216, 217) for restricting the tilt directions of the crystal molecules 110, the domain defining member including a longitudinal opening 216 in the pixel electrode 21 dividing a portion of the pixel electrode into two partitions and an aperture (e.g. 211, 212) in the common electrode 11 having at least one longitudinal 211 portion dividing one of the two partitions (Figs. 3-5).

(See also Figs. 6, 9, 12, and 13 --especially Fig. 9.)

Kim does not indicate that the voltage of the first gray is less than or equal to 1.4 V.

Walters teaches that it is standard practice in the art to use a voltage less than or equal to about 1.4 V for the first gray voltage (i.e. V_{off}), such as 0 V and 1.12 V, and 1.45 (col. 3, line 45 to col. 4, line 33).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use a first gray of 1.4 V or less as the first gray voltage in **Kim** in order to minimize power consumption and because it is standard practice in the art, as indicated in **Walters**.

Regarding claim 14, **Kim** discloses the domain-defining member includes a plurality of openings 216, 217 arranged laterally along a longitudinal direction, with at least one opening disposed in a direction transverse to the longitudinal direction (e.g. Fig. 3).

Response to Arguments

16. Applicant's arguments filed 25 August 2004 have been fully considered but they are not persuasive.

Applicant traverses the rejections for the same reasons as Applicant has traversed the rejections to the last two Office actions. Applicant's arguments are premised upon the *alleged* failure of Hirose to teach that the contrast quotient generated by dividing the contrast at "V_{OFF}" a and the contrast when zero voltage is applied between the pixel electrode and the common electrode is greater than or equal to about 0.8 for all viewing angles. Even though Applicant admits that Hirose teaches that the quotient is infinite for at least one viewing angle, Applicant argues that it would not inherently be greater than or equal to 0.8 for all viewing angles. Examiner respectfully disagrees for reasons presented in the rejection above, which are included herein by reference.

While Applicant's conjecture that

"even though a voltage yields a high contrast ratio for a viewing angle directly in front of the display, the contrast ratio for a side viewing angle at that voltage cannot be an infinite value. Indeed, such contrast ratio is probably a very low value that is less than 0.8 times the contrast ratio at zero volts." (Emphasis in original.)

Applicant is reminded that the burden of proof in inherency arguments is Applicant's, yet Applicant continues to fail to come forward with the evidence. Instead, Applicant continues to speculate about that which Hirose shows or does not show. MPEP 2145 states that "**argument does not replace evidence where evidence is necessary.**" (Emphasis added.) Applicant's conjecture, while noted, is not sufficient to overcome the inherency argument. Examiner has presented a rationale as noted above in the rejection. It is of little persuasiveness for Applicant to

merely speculate that the ratio of contrasts, while shown to be infinite at the center viewing angle, would somehow drop from **infinity** all the way down to less than 0.8 at some other viewing angle --especially since Hirose specifically states that the asymmetry of viewing angle is removed. (See Hirose at least at col. 2, lines 55-59 and col. 6, lines 46-52.) Applicant is invited to provide evidence demonstrating that Hirose does not inherently meet this limitation for all viewing angles given the evidence of record indicating that it would be at least greater than 0.8 for all viewing angles.

Further in this regard, it is well settled, the fact that a characteristic is a necessary feature or result of a prior-art embodiment (that is itself sufficiently described and enabled) is enough for inherent anticipation, **even if that fact was unknown at the time of the prior invention**. See, e.g., id. at 1378; *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999) ("[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer.").

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

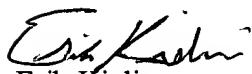
US 6,342,938 B1 (**Song et al.**) appears to be the a member of the patent family of which the **Kim** reference above is a member and is clearly a 102(e) reference anticipating each of claims 15-20.

Each of US 5,309,264 (**Lien et al.**; all figures) and US 6,229,589 B1 (**Koma**; all figures) anticipates at least claim 15.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
December 6, 2004